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THE SUMMER RANGE OF COLORADO BIRDS.

BY W. W. COOKE.

NO OTHER State in the Union has so great a variety of birds as Colorado. This arises from its location at the meeting place of eastern and western forms. The continental divide passes through the middle of the State, and while the plains of the southeast offer a fit habitation for most of the Mississippi Valley birds, the western slopes are visited by most of the Pacific coast species. Many southern birds reach Colorado during the heat of summer and most of the northern birds can be found on her mountains in winter. Such a combination of location and topography results in a widely varied bird fauna. There has not been much study made of Colorado ornithology, but up to date the State list includes 347 species. The general character of the fauna is western as shown by the fact that

there are only 60 eastern birds found here, meaning by eastern, those that are generally distributed in the East and extend only to the Rocky Mountains; while there are 90 species of western birds found here that do not occur to the eastward, in addition to 22 species that are peculiar to the Rocky Mountains, and 13 species that reach Colorado from the southwest. The remainder of our State's quota is made up of 16 species from the north, 17 from the south, 2 from the southeast, and 127 species that are of general distribution throughout the United States.

It is not, however, of Colorado bird-life as a whole that it is intended to speak, but of the summer birds. It is at this time of year that the mountainous character of the surface exerts the greatest influence on bird life. This can be shown most easily by a comparison with the prairie States to the eastward. The State list of Kansas numbers 335 species, of which 175 are known to breed in the State. Illinois, from about an equal number of species, shows 205 breeders. This large proportion of nesting species is due to the great extent of Illinois north and south. The same result is reached in Colorado through the effect of the mountains. Out of 347 species known to the State, 236 have been already ascertained to breed within her limits, and it is probable that almost one-half of the remainder will some day be added to the list of breeders. In broad terms it can be stated, that few birds occur in the State at any season of the year that are not also found there in summer. And why should it not be so. In a prairie State, the great bulk of the winter and early spring birds pass on northward to find a cool climate suitable to their nature and inclination. What these birds obtain by a northward journey of a thousand miles, their western cousins in Colorado duplicate by a trip of less than one-twentieth the distance. The everlasting snows lie on about one hundred peaks of the Colorado mountains, and in their vicinity the hardiest birds can find congenial summer homes. The converse is also true; each of the widely varied portions of the State, at any and all seasons of the year, is inhabited by a goodly variety of birds. There is a climate for each bird and a bird for each climate. One would expect to find bird-life in May

among the blooming peach trees of the Colorado Valley, but at the same time there would be found almost as great a variety of birds, and nearly as many individuals, along the edges of the snow banks high up in the mountain sides. When in July we climbed Long's Peak (over 14,000 feet high, almost the highest in the State), having to wade through snow for twenty-five hundred feet of the way, we found a Brown Leucosticte (*L. australis*) on top waiting to receive us. The snow was covered with bird tracks, showing that our host was not the only inhabitant of the peak. What could be found there for a seed-eating bird to live on is a mystery, for the nearest vegetation was two thousand feet below, and another thousand to the nearest trees. Half an hour later we were caught in a terrific hail storm, and we sighed for the wings of our little friend to bear us to the sunlit fields we could occasionally catch glimpses of below us.

There yet remains an immense amount of work to be done to ascertain the limits of the range of the different species during the breeding season. Each kind seems to be a law unto itself, and it is not safe to judge from one species what will be the breeding range of even closely allied species. The common Raven is found from the foothills to the tops of the highest peaks, while the White-necked Raven, so similar as to be scarcely distinguishable unless in hand, never climbs even to the base of the main range. The Rocky Mountain Bluebird nests indiscriminately from the plains to the uppermost edge of timber, while the western form of the common Bluebird never goes above the lower parks. The Brown Creeper remains throughout the year high up on the mountain sides near the upper limit of timber, while the Cañon Wren remains continuously five thousand feet lower in the rocky cañons that are the source of its name. The Red-shafted Flicker deserts the mountains in the winter and becomes a common bird of the plains, but with the return of spring it ascends the peaks and sometimes nests even above timber line. The barren wastes near the tops of the tallest peaks are inhabited in summer by birds of widely different characters. The Brown Leucosticte, already mentioned, the Brown Lark (*Anthus ludovicianus*) and the White-tailed Ptarmigan (*Lagopus leucurus*) nest in close proximity two thousand feet

above the nearest trees. But how different the winter range of these three species. The Ptarmigan remains as high up as it can get food, being slowly forced downward by the autumnal gales, but finding a precarious living through the winter on the spruce buds along the upper edge of the timber, 11,000 feet above the sea. The Sparrow is found from timber line to the lower part of the foothills; while the Lark deserts the mountains and even the whole State to seek warmer quarters in the south.

The surface of Colorado can be divided into several distinct areas. In the eastern part is a wide stretch of plain from 4000 to 5000 feet elevation above the sea; then come ranges of foothills, 5000 to 7000 feet high. The 'parks' are broad areas of rolling prairie at an elevation of 7000 to 9000 feet, lying between the main ranges of mountains. Around them are the mountain sides clothed with timber to about 11,000 feet, while higher up are the treeless summits. Thus we have in Colorado, the plains, the foothills, the parks, the timbered mountain sides and the barren summits. Each of these during summer has its own peculiar bird-life. The number of individual birds on the plains is much greater than elsewhere. But bird-life in Colorado at best is not nearly so numerous as in the Mississippi Valley at the same latitude. There is a greater variety of birds among the foothills, but not so many individuals as on the plains. The great bulk of these plains birds is made up of a few species. The most common are the Western Meadowlark, the Mourning Dove, Red-winged Blackbird, Say's Phœbe, Bullock's Oriole, Killdeer, American Goldfinch, Shore Lark, Western Lark Finch, Lark Bunting, Eave Swallow, Rocky Mountain Bluebird, and Black-headed Grosbeak.

These all extend up on the foothills and have added to them many species of timber birds, such as the Rock Wren, Magpie, Long-crested Jay, and Lewis's Woodpecker. Most of the birds of the plains occur also in the parks, but their numbers are greatly decreased. These parks seem especially adapted to support bird-life, but there are probably not one-fourth as many individuals per square mile as on the plains near the foothills. The most common birds of the plains become rare in the parks, noticeably the Western Meadowlark, Mourning Dove, Say's Phœbe and

the Lark Bunting. The higher you climb on the mountain sides, the stiller the woods become. A great many different species occur, but their numbers are so small that the woods are almost as silent as the White Mountains of New England.

The following statistics will show the distribution of Colorado birds during the breeding season:—

BREEDING RANGE.

From the plains to 5000 feet,	29 species.
“ “ “ 6000 “	12 “
“ “ “ 7000 “	17 “
“ “ “ 8000 “	26 “
“ “ “ 9000 “	7 “
“ “ “ 10000 “	16 “
“ “ “ 11000 “	18 “
“ 5000 feet “ 6000 “	2 “
“ “ “ 7000 “	4 “
“ “ “ 8000 “	13 “
“ “ “ 9000 “	8 “
“ “ “ 10000 “	5 “
“ “ “ 11000 “	7 “
“ 6000 “ “ 7000 “	17 “
“ “ “ 8000 “	5 “
“ “ “ 9000 “	2 “
“ “ “ 10000 “	2 “
“ “ “ 11000 “	4 “
“ 7000 “ “ 10000 “	6 “
“ “ “ 11000 “	6 “
“ 8000 “ “ 8500 “	5 “
“ “ “ 10000 “	5 “
“ “ “ 11000 “	4 “
“ 9000 “ “ 9500 “	3 “
“ “ “ 11000 “	1 “
“ 10000 “ “ 10500 “	1 “
“ “ “ 11000 “	4 “
“ 11000 “ “ 11500 “	3 “
“ 12000 “ upward	4 “

This table can be combined into the following statements:—

Total breeders in the State, 236 species.

Breeding only on the Plains, 29 “

Breeding above 5000 feet and upward, 207 “

Breeding above 6000 feet and upward, 193 species.

"	"	7000	"	"	"	155	"
"	"	8000	"	"	"	106	"
"	"	9000	"	"	"	86	"
"	"	10000	"	"	"	51	"
"	"	11000	"	"	"	40	"

That do not breed below 5000 feet, 101 species.

"	"	"	"	6000	"	72	"
"	"	"	"	7000	"	42	"
"	"	"	"	8000	"	30	"
"	"	"	"	9000	"	16	"
"	"	"	"	10000	"	11	"
"	"	"	"	11000	"	7	"
"	"	"	"	12000	"	4	"

Breeding at 5000 feet, 164 species.

"	"	6000	"			165	"
"	"	7000	"			163	"
"	"	8000	"			139	"
"	"	9000	"			94	"
"	"	10000	"			79	"
"	"	11000	"			47	"

As before remarked, the birds of Colorado, especially as to their breeding range, have been but little studied, and any eastern ornithologist who wishes to combine collecting and investigation with recreation and a new supply of health can find no better field for his summer outing than the parks and peaks of the Rocky Mountains of Colorado.

ADDITIONAL CHARACTERS OF THE MACROPTERYGIDÆ.

BY FREDERIC A. LUCAS.

IN 'The Auk' for January, 1889, I proposed the family *Dendrochelidonidae* for the reception of the Tree Swifts of Malaysia, establishing it upon well-marked characters found in the cranium and shoulder-girdle. Unfortunately I was not then aware that